



# SEQUENCE LISTING

<110> Qi, Yan  
Zhang, Xianghua  
Konigsberg, Paula

<120> Gene Therapy Vectors Having Reduced Immunogenicity

<130> A-72186-1/TAL/DCF (471702-00008)

<140> US 10/804,763

<141> 2004-03-19

<150> US 60/456,378

<151> 2003-03-19

<160> 51

<170> PatentIn version 3.2

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<212> PRT

<213> Homo sapiens

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Trp Asn Leu Gly Glu Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser  
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Asn Pro Thr Ser Gly Cys Ser Trp Leu Phe Gln Pro Arg Gly Ala Ala  
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Ala Ser Pro Thr Phe Leu Leu Tyr Leu Ser Gln Asn Lys Pro Lys Ala  
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Ala Glu Gly Leu Asp Thr Gln Arg Phe Ser Gly Lys Arg Leu Gly Asp  
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Thr Phe Val Leu Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr  
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Tyr Phe Cys Ser Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe  
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Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg  
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Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg  
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Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr  
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Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His  
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His Ala Ala Arg Pro Ser Gln Phe Arg Val Ser Pro Leu Asp Arg Thr
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Trp Asn Leu Gly Glu Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser
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Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg  
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Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg  
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 Thr Phe Val Leu Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr  
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 Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu  
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Val Asp Leu Val Cys Glu Val Leu Gly Ser Val Ser Gln Gly Cys Ser  
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Trp Leu Phe Gln Asn Ser Ser Ser Lys Leu Pro Gln Pro Thr Phe Val  
65 70 75 80

Val Tyr Met Ala Ser Ser His Asn Lys Ile Thr Trp Asp Glu Lys Leu  
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Asn Ser Ser Lys Leu Phe Ser Ala Met Arg Asp Thr Asn Asn Lys Tyr  
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Val Leu Thr Leu Asn Lys Phe Ser Lys Glu Asn Glu Gly Tyr Tyr Phe  
115 120 125

Cys Ser Val Ile Ser Asn Ser Val Met Tyr Phe Ser Ser Val Val Pro  
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Val Leu Gln Lys Val Asn Ser Thr Thr Thr Lys Pro Val Leu Arg Thr  
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Pro Ser Pro Val His Pro Thr Gly Thr Ser Gln Pro Gln Arg Pro Glu  
165 170 175

Asp Cys Arg Pro Arg Gly Ser Val Lys Gly Thr Gly Leu Asp Phe Ala  
180 185 190

Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Ile Cys Val Ala Leu  
195 200 205

Leu Leu Ser Leu Ile Ile Thr Leu Ile Cys Tyr His Arg Ser Arg Lys  
210 215 220

Arg Val Cys Lys Cys Pro Ser Ile Ala Cys Leu Cys Leu Lys Leu Gln  
 225 230 235 240

Gly Ser Lys Trp Tyr Glu Ser Val Ile Cys Ser Ala Leu Ala Val Ser  
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Ile Arg Cys Asn Lys Ser Lys Ser Gly Glu Leu Pro Leu Ala Val His  
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Met Arg Asp Thr Asn Asn Lys Tyr Val Leu Thr Leu Asn Lys Phe Ser  
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Lys Glu Asn Glu Gly Tyr Tyr Phe Cys Ser Val Ile Ser Asn Ser Val  
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Met Tyr Phe Ser Ser Val Val Pro Val Leu Gln Lys Val Asn Ser Thr  
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Thr Thr Lys Pro Val Leu Arg Thr Pro Ser Pro Val His Pro Thr Gly  
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Thr Ser Gln Pro Gln Arg Pro Glu Asp Cys Arg Pro Arg Gly Ser Val  
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Lys Gly Thr Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro  
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Leu Ala Gly Ile Cys Val Ala Leu Leu Leu Ser Leu Ile Ile Thr Leu  
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Val Leu Thr Leu Asn Lys Phe Ser Lys Glu Asn Glu Gly Tyr Tyr Phe  
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Cys Ser Val Ile Ser Asn Ser Val Met Tyr Phe Ser Ser Val Val Pro  
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Met Ala Ser Arg Val Ile Cys Phe Leu Ser Leu Asn Leu Leu Leu Leu
1           5           10           15

```

```

Asp Val Ile Thr Arg Leu Gln Val Ser Gly Gln Leu Gln Leu Ser Pro
20           25           30

```

```

Lys Lys Val Asp Ala Glu Ile Gly Gln Glu Val Lys Leu Thr Cys Glu
35           40           45

```

```

Val Leu Arg Asp Thr Ser Gln Gly Cys Ser Trp Leu Phe Arg Asn Ser
50           55           60

```

```

Ser Ser Glu Leu Leu Gln Pro Thr Phe Ile Ile Tyr Val Ser Ser Ser
65           70           75           80

```

```

Arg Ser Lys Leu Asn Asp Ile Leu Asp Pro Asn Leu Phe Ser Ala Arg
85           90           95

```

```

Lys Glu Asn Asn Lys Tyr Ile Leu Thr Leu Ser Lys Phe Ser Thr Lys
100          105          110

```

```

Asn Gln Gly Tyr Tyr Phe Cys Ser Ile Thr Ser Asn Ser Val Met Tyr
115          120          125

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```
Phe Ser Pro Leu Val Pro Val Phe Gln Lys Val Asn Ser Ile Ile Thr
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130

135

140

Lys Pro Val Thr Arg Ala Pro Thr Pro Val Pro Pro Pro Thr Gly Thr  
145 150 155 160

Pro Arg Pro Leu Arg Pro Glu Ala Cys Arg Pro Gly Ala Ser Gly Ser  
165 170 175

Val Glu Gly Met Gly Leu Gly Phe Ala Cys Asp Ile Tyr Ile Trp Ala  
180 185 190

Pro Leu Ala Gly Ile Cys Ala Val Leu Leu Leu Ser Leu Val Ile Thr  
195 200 205

Leu Ile Cys Cys His Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg  
210 215 220

Pro Leu Val Lys Pro Arg Pro Ser Glu Lys Phe Val  
225 230 235

<210> 14  
<211> 1010  
<212> DNA  
<213> Rattus norvegicus

<400> 14  
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1010

<210> 15  
<211> 237  
<212> PRT  
<213> Cavia porcellus

<400> 15

Met Ala Pro Arg Gly Ser Ala Trp Leu Leu Leu Leu Pro Val Ala Leu  
1 5 10 15

Leu Leu Asp Ala Ala Thr Ala Gln Gly Ala Ser Gln Phe Arg Met Ser  
20 25 30

Pro Arg Glu Leu Val Ala Gln Val Gly Thr Lys Val Thr Leu Arg Cys  
35 40 45

Glu Val Leu Val Pro Asn Ala Pro Ala Gly Cys Ser Trp Leu Phe Gln  
50 55 60

Pro Arg His Asp Ala Lys Gly Pro Thr Phe Leu Leu Tyr His Ser Ala  
65 70 75 80

Ser Gly Thr Lys Leu Ala Pro Gly Leu Glu Gln Lys Arg Phe Ser Pro  
85 90 95

Ser Lys Ser Ser Asn Thr Tyr Thr Leu Thr Val Asn Ser Phe Gln Lys  
100 105 110

Arg Asp Glu Gly Tyr Tyr Phe Cys Ser Val Ser Gly Asn Met Met Leu  
115 120 125

Tyr Phe Ser Pro Phe Val Pro Val Phe Leu Pro Ala Pro Arg Thr Thr  
130 135 140

Thr Pro Pro Pro Pro Pro Thr Thr Pro Thr Pro Ser Val Gln Pro Thr  
145 150 155 160

Ser Val Arg Pro Glu Thr Cys Val Val Ser Lys Gly Ala Ala Gly Ala  
165 170 175

Arg Trp Leu Asp Leu Ser Cys Asp Val Tyr Ile Trp Ala Pro Leu Ala  
180 185 190

Ser Thr Cys Ala Ala Leu Leu Leu Ala Leu Val Ile Thr Ile Ile Cys  
195 200 205

His Arg Arg Asn Arg Gln Arg Val Cys Lys Cys Pro Arg Pro Gln Ala  
210 215 220

Arg Ser Gly Gly Lys Pro Ser Pro Ser Gly Lys Leu Val  
 225 230 235

<210> 16  
 <211> 1330  
 <212> DNA  
 <213> *Cavia porcellus*

<400> 16  
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 aaaaaaaaaa 1330

<210> 17  
 <211> 242  
 <212> PRT  
 <213> *Bos taurus*

<400> 17

Met Ala Ser Leu Leu Thr Ala Leu Ile Leu Pro Leu Ala Leu Leu Leu  
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Leu Asp Ala Ala Lys Val Leu Gly Ser Leu Ser Phe Arg Met Ser Pro  
20 25 30

Thr Gln Lys Glu Thr Arg Leu Gly Glu Lys Val Glu Leu Gln Cys Glu  
35 40 45

Leu Leu Gln Ser Gly Met Ala Thr Gly Cys Ser Trp Leu Arg His Ile  
50 55 60

Pro Gly Asp Asp Pro Arg Pro Thr Phe Leu Met Tyr Leu Ser Ala Gln  
65 70 75 80

Arg Val Lys Leu Ala Glu Gly Leu Asp Pro Arg His Ile Ser Gly Ala  
85 90 95

Lys Val Ser Gly Thr Lys Phe Gln Leu Thr Leu Ser Ser Phe Leu Gln  
100 105 110

Glu Asp Gln Gly Tyr Tyr Phe Cys Ser Val Val Ser Asn Ser Ile Leu  
115 120 125

Tyr Phe Ser Asn Phe Val Pro Val Phe Leu Pro Ala Lys Pro Ala Thr  
130 135 140

Thr Pro Ala Met Arg Pro Ser Ser Ala Ala Pro Thr Ser Ala Pro Gln  
145 150 155 160

Thr Arg Ser Val Ser Pro Arg Ser Glu Val Cys Arg Thr Ser Ala Gly  
165 170 175

Ser Ala Val Asp Thr Ser Arg Leu Asp Phe Ala Cys Asn Ile Tyr Ile  
180 185 190

Trp Ala Pro Leu Val Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val  
195 200 205

Ile Thr Gly Ile Cys Tyr Arg Arg Asn Arg Arg Arg Val Cys Lys Cys  
210 215 220

Pro Arg Pro Val Val Arg Gln Gly Gly Lys Pro Asn Leu Ser Glu Lys  
225 230 235 240

Tyr Val

<210> 18



<211> 2001  
<212> DNA  
<213> Bos taurus

<400> 18  
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<210> 19  
<211> 236  
<212> PRT  
<213> Sus scrofa

<400> 19

Met Ala Ser Leu Val Thr Ala Leu Leu Leu Pro Leu Val Leu Gln Leu  
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His Pro Ala Lys Val Leu Gly Ser Ser Leu Phe Arg Thr Ser Pro Glu  
20 25 30

Met Val Gln Ala Ser Leu Gly Glu Thr Val Lys Leu Arg Cys Glu Val  
35 40 45

Met His Ser Asn Thr Leu Thr Ser Cys Ser Trp Leu Tyr Gln Lys Pro  
50 55 60

Gly Ala Ala Ser Lys Pro Ile Phe Leu Met Tyr Leu Ser Lys Thr Arg  
65 70 75 80

Asn Lys Thr Ala Glu Gly Leu Asp Thr Arg Tyr Ile Ser Gly Tyr Lys  
85 90 95

Ala Asn Asp Asn Phe Tyr Leu Ile Leu His Arg Phe Arg Glu Glu Asp  
100 105 110

Gln Gly Tyr Tyr Phe Cys Ser Phe Leu Ser Asn Ser Val Leu Tyr Phe  
115 120 125

Ser Asn Phe Met Ser Val Phe Leu Pro Ala Lys Pro Thr Lys Thr Pro  
130 135 140

Thr Thr Pro Pro Pro Lys Arg Thr Pro Thr Lys Ala Ser His Ala Val  
145 150 155 160

Ser Val Ala Pro Glu Val Cys Arg Pro Ser Gly Asn Ala Asp Pro Arg  
165 170 175

Lys Leu Asp Leu Ala Cys Asp Leu Tyr Asn Trp Ala Pro Leu Val Gly  
180 185 190

Thr Ser Gly Ile Leu Leu Leu Ser Leu Val Ile Thr Ile Ile Cys His

195

200

205

Arg Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val Arg  
 210 215 220

Gln Gly Gly Lys Ala Ser Pro Ser Glu Arg Phe Ile  
 225 230 235

<210> 20  
 <211> 2179  
 <212> DNA  
 <213> Sus scrofa

<400> 20  
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 tgtatacttt ttaaaaatgg aattgtacta tgcttttaga agtgggttta ataaacattt 2160  
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<210> 21  
 <211> 239  
 <212> PRT  
 <213> Felis catus

<400> 21

Met Ala Ser Pro Val Thr Ala Gln Leu Leu Pro Leu Ala Leu Leu Leu  
1 5 10 15

His Ala Ala Ala Ala Ala Gly Pro Ser Pro Phe Arg Leu Ser Pro Val  
20 25 30

Arg Val Glu Gly Arg Leu Gly Gln Arg Val Glu Leu Gln Cys Glu Val  
35 40 45

Leu Leu Ser Ser Ala Ala Pro Gly Cys Thr Trp Leu Phe Gln Lys Asn  
50 55 60

Glu Pro Ala Ala Arg Pro Ile Phe Leu Ala Tyr Leu Ser Arg Ser Arg  
65 70 75 80

Thr Lys Leu Ala Glu Glu Leu Asp Pro Lys Gln Ile Ser Gly Gln Arg  
85 90 95

Ile Gln Asp Thr Leu Tyr Ser Leu Thr Leu His Arg Phe Arg Lys Glu  
100 105 110

Glu Glu Gly Tyr Tyr Phe Cys Ser Val Val Ser Asn Ser Val Leu Tyr  
115 120 125

Phe Ser Ala Phe Val Pro Val Phe Leu Pro Val Lys Pro Thr Thr Thr  
130 135 140

Pro Ala Pro Arg Pro Pro Thr Gln Ala Pro Ile Thr Thr Ser Gln Arg  
145 150 155 160

Val Ser Leu Arg Pro Gly Thr Cys Gln Pro Ser Ala Gly Ser Thr Val  
165 170 175

Glu Ala Ser Gly Leu Asp Leu Ser Cys Asp Ile Tyr Ile Trp Ala Pro  
180 185 190

Leu Ala Gly Thr Cys Ala Phe Leu Leu Leu Ser Leu Val Ile Thr Val  
195 200 205

Ile Cys Asn His Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro  
210 215 220

Val Val Arg Ala Gly Gly Lys Pro Ser Pro Ser Glu Arg Tyr Val  
225 230 235

<210> 22  
<211> 785  
<212> DNA  
<213> Felis catus

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acagt 785

<210> 23

<211> 235  
<212> PRT  
<213> Sigmodon hispidus

<400> 23

Met Ala Pro Arg Val Thr Arg Phe Leu Cys Leu Thr Leu Leu Leu Glu  
1 5 10 15

Phe Ile Ala Glu Leu Gly Gly Ser Lys Asp Phe Glu Met Ser Pro Lys  
20 25 30

Lys Val Val Ala His Leu Gly Lys Glu Val Arg Leu Thr Cys Glu Val  
35 40 45

Trp Val Ser Thr Ser Gln Gly Cys Ser Trp Leu Phe Leu Glu His Gly  
50 55 60

Ser Gly Val Lys Pro Thr Phe Leu Ile Tyr Leu Ser Gly Ser Arg Asn  
65 70 75 80

Glu Arg Asn Asn Lys Ile Pro Ser Thr Lys Leu Ser Gly Lys Lys Glu  
85 90 95

Asp Lys Lys Tyr Thr Leu Thr Leu Asn Asn Phe Ala Lys Glu Asp Glu  
100 105 110

Gly Tyr Tyr Phe Cys Ser Val Thr Ser Asn Ser Val Val Tyr Phe Ser  
115 120 125

Pro Leu Val Ser Val Phe Leu Pro Glu Lys Pro Thr Thr Pro Val Pro  
130 135 140

Lys Pro Pro Thr Ser Val Pro Thr Thr Ala Ile Ser Arg Ser Leu Arg  
145 150 155 160

Pro Glu Ala Cys Arg Pro Gly Ala Gly Thr Ser Val Glu Lys Lys Gly  
165 170 175

Trp Asp Phe Asp Cys Asp Ile Ile Ile Leu Ala Pro Leu Ala Gly Leu  
180 185 190

Cys Gly Val Leu Leu Leu Ser Leu Val Thr Thr Leu Ile Cys Cys His  
195 200 205

Arg Asn Arg Lys Arg Val Cys Lys Cys Pro Arg Pro Val Val Arg Gln  
210 215 220

Gly Gly Lys Pro Ser Pro Ser Gly Lys Leu Val  
225 230 235

<210> 24  
 <211> 1229  
 <212> DNA  
 <213> Sigmodon hispidus

<400> 24  
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 gtgggtgtct acttcgcaag gatgctcttg gctcttcctg gagcatggct ccggaggtta 240  
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<210> 25  
 <211> 235  
 <212> PRT  
 <213> Saimiri sciureus

<400> 25

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His Ala Ala Arg Pro Ser Arg Phe Arg Val Ser Pro Leu Asp Arg Thr  
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Trp Asn Leu Gly Asp Lys Val Glu Leu Lys Cys Glu Val Leu Leu Ser  
 35 40 45  
 Asn Pro Ser Ser Gly Cys Ser Trp Leu Phe Gln Lys Arg Gly Ala Ala  
 50 55 60  
 Ala Ser Pro Thr Phe Leu Leu Tyr Ile Ser Gln Thr Lys Pro Lys Val  
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 Ala Asp Gly Leu Asp Ala Gln Arg Phe Ser Gly Lys Lys Met Gly Asp  
 85 90 95  
 Ser Phe Ile Leu Thr Leu Arg Asp Phe Arg Glu Glu Asp Gln Gly Phe  
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 Tyr Phe Cys Ser Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser Pro Phe  
 115 120 125  
 Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg  
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 Pro Pro Thr Pro Glu Pro Thr Thr Ala Ser Gln Pro Leu Ser Leu Arg  
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 Pro Gln Ala Cys Arg Pro Pro Ala Gly Gly Ala Val Asp Thr Arg Gly  
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 Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Val Pro Leu Ala Gly Thr  
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 Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Val Tyr Cys Asn His  
 195 200 205  
 Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Ala Val Lys Ser  
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 Gly Gly Lys Pro Ser Pro Ser Glu Arg Tyr Val  
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<210> 26  
 <211> 708  
 <212> DNA  
 <213> Saimiri sciureus

<400> 26  
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<210> 27  
 <211> 235  
 <212> PRT  
 <213> Homo sapiens

<400> 27

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His Ala Ala Arg Pro Ser Gly Phe Arg Val Ser Pro Leu Asp Arg Thr  
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Trp Asn Leu Gly Glu Thr Val Glu Leu Lys Cys Gly Val Leu Leu Ser  
35 40 45

Asn Pro Thr Ser Gly Cys Ser Trp Leu Phe Gly Pro Arg Gly Ala Ala  
50 55 60

Ala Ser Pro Thr Phe Leu Leu Tyr Leu Ser Gly Asn Lys Pro Lys Ala  
65 70 75 80

Ala Glu Gly Leu Asp Thr Gly Arg Phe Ser Gly Lys Arg Leu Gly Asp  
85 90 95

Thr Phe Val Leu Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr  
100 105 110

Tyr Phe Cys Ser Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe  
115 120 125

Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg  
130 135 140

Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gly Pro Leu Ser Leu Arg  
145 150 155 160

Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly  
165 170 175

Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr  
180 185 190

Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His  
195 200 205

Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val Lys Ser  
210 215 220

Gly Asp Lys Pro Ser Leu Ser Ala Arg Tyr Val  
225 230 235

<210> 28  
<211> 708  
<212> DNA  
<213> Homo sapiens

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gttatcacc tttactgcaa ccacaggaac cgaagacgtg tttgcaaatg tccccggcct 660  
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<210> 29  
<211> 310  
<212> PRT  
<213> Mus musculus

<400> 29

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Gly Glu Ser Ile Ile Leu Gly Ser Gly Glu Ala Lys Pro Gly Ala Pro  
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Glu Leu Arg Ile Phe Pro Lys Lys Met Asp Ala Glu Leu Gly Gly Lys  
35 40 45

Val Asp Leu Val Cys Glu Val Leu Gly Ser Val Ser Gly Gly Cys Ser  
50 55 60

Trp Leu Phe Gly Asn Ser Ser Ser Lys Leu Pro Gly Pro Thr Phe Val  
65 70 75 80

Val Tyr Met Ala Ser Ser His Asn Lys Ile Thr Trp Asp Glu Lys Leu  
85 90 95

Asn Ser Ser Lys Leu Phe Ser Ala Met Arg Asp Thr Asn Asn Lys Tyr  
100 105 110

Val Leu Thr Leu Asn Lys Phe Ser Lys Glu Asn Glu Gly Tyr Tyr Phe  
115 120 125

Cys Ser Val Ile Ser Asn Ser Val Met Tyr Phe Ser Ser Val Val Pro  
130 135 140

Val Leu Gly Lys Val Asn Ser Thr Thr Thr Lys Pro Val Leu Arg Thr  
145 150 155 160

Pro Ser Pro Val His Pro Thr Gly Thr Ser Gly Pro Gly Arg Pro Glu  
165 170 175

Asp Cys Arg Pro Arg Gly Ser Val Lys Gly Thr Gly Leu Asp Phe Ala  
180 185 190

Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Ile Cys Val Ala Leu  
195 200 205

Leu Leu Ser Leu Ile Ile Thr Leu Ile Cys Tyr His Arg Ser Arg Lys  
210 215 220

Arg Val Cys Lys Cys Pro Ser Ile Ala Cys Leu Cys Leu Lys Leu Gly  
225 230 235 240

Gly Ser Lys Trp Tyr Glu Ser Val Ile Cys Ser Ala Leu Ala Val Ser  
245 250 255

Ile Arg Cys Asn Lys Ser Lys Ser Gly Glu Leu Pro Leu Ala Val His  
260 265 270

Leu Asp Ile Arg Ala Pro Cys Lys Asn Trp Glu Ile Ala Gly Ser Leu  
275 280 285

Val Glu Arg Tyr Gly Lys Ser Gly Lys His Ser Pro Leu Ser Leu Lys  
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Ala Val Val Glu Ser Asn  
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 <212> DNA  
 <213> Mus musculus

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<210> 31  
 <211> 626  
 <212> DNA  
 <213> Homo sapiens

<400> 31  
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 <212> DNA  
 <213> Homo sapiens

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 <211> 1937  
 <212> DNA  
 <213> Homo sapiens

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 <212> DNA  
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 <212> DNA  
 <213> Homo sapiens

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2197

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 <211> 247  
 <212> PRT  
 <213> Mus musculus

<400> 50

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Glu Leu Arg	Ile Phe Pro Lys	Lys Met Asp Ala Glu	Leu Gly Gln Lys
	35	40	45
Val Asp Leu	Val Cys Glu Val	Leu Gly Ser Val	Ser Gln Gly Cys Ser
	50	55	60
Trp Leu Phe	Gln Asn Ser Ser	Ser Lys Leu Pro	Gln Pro Thr Phe Val
	65	70	75
Val Tyr Met	Ala Ser Ser His	Asn Lys Ile Thr	Trp Asp Glu Lys Leu
	85	90	95
Asn Ser Ser	Lys Leu Phe Ser	Ala Val Arg Asp	Thr Asn Asn Lys Tyr
	100	105	110
Val Leu Thr	Leu Asn Lys Phe	Ser Lys Glu Asn	Glu Gly Tyr Tyr Phe
	115	120	125
Cys Ser Val	Ile Ser Asn Ser	Val Met Tyr Phe	Ser Ser Val Val Pro
	130	135	140
Val Leu Gln	Lys Val Asn Ser	Thr Thr Thr Lys	Pro Val Leu Arg Thr
	145	150	155
Pro Ser Pro	Val His Pro Thr	Gly Thr Ser Gln	Pro Gln Arg Pro Glu
	165	170	175
Asp Cys Arg	Pro Arg Gly Ser	Val Lys Gly Thr	Gly Leu Asp Phe Ala
	180	185	190
Cys Asp Ile	Tyr Ile Trp Ala	Pro Leu Ala Gly	Ile Cys Val Ala Pro
	195	200	205
Leu Leu Ser	Leu Ile Ile Thr	Leu Ile Cys Tyr	His Arg Ser Arg Lys
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Arg Val Cys	Lys Cys Pro Arg	Pro Leu Val Arg	Gln Glu Gly Lys Pro
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Arg Pro Ser	Glu Lys Ile Val		
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<210> 51  
 <211> 197



<212> PRT  
<213> Homo sapiens

<400> 51

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Trp Asn Leu Gly Trp Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser  
35 40 45

Asn Pro Thr Ser Gly Cys Ser Trp Leu Phe Gln Pro Arg Gly Ala Ala  
50 55 60

Ala Ser Pro Thr Phe Leu Leu Tyr Leu Ser Gln Asn Lys Pro Lys Ala  
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Ala Glu Gly Leu Asp Thr Gln Arg Phe Ser Gly Lys Arg Leu Gly Asp  
85 90 95

Thr Phe Val Leu Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr  
100 105 110

Tyr Phe Cys Ser Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe  
115 120 125

Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg  
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Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg  
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Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Gly Asn Arg Arg Arg  
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Val Cys Lys Cys Pro Arg Pro Val Val Lys Ser Gly Asp Lys Pro Ser  
180 185 190

Leu Ala Arg Tyr Val  
195